Bull. Natn. Sci. Mus., Tokyo, Ser. A, **23**(2), pp. 97–106, June 23, 1997

Two New Crabs of the Family Xanthidae from Japan

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Abstract Two new species of the family Xanthidae, *Atergatis interruptus* and *Meriola corallina*, are described on some specimens from shallow waters off the Kii Peninsula, central Japan. They are closely related to *A. laevigatus* A. Milne Edwards from India and the Red Sea and *M. rufomaculata* Davie from the Tuamotu Archipelago, respectively, but differ from them most remarkably in the shape of the anterolateral margin of the carapace.
Key words: Xanthidae, new species, *Atergatis interruptus*, *Meriola corallina*, central Japan.

During the course of taxonomic and faunal studies on the crabs from west coast of the Kii Peninsula, central Japan, we encountered some remarkable specimens referable to the genera *Atergatis* de Haan and *Meriola* Davie of the family Xanthidae. The former genus is well established on eleven Indo-West Pacific species including only two or three poorly known species, while the latter genus represented by *M. rufomaculata* Davie from the Tuamotu Archipelago and *M. acutidens* (Sakai) from Japan is characterized by the combination of some features such as the *Liomera*-like carapace and the exceedingly long ambulatory legs. Consulting the literature concerned, it was decided that the specimens at hand represent a new species of each genus. In the following lines they are described under the names of *Atergatis interruptus* and *Meriola corallina*.

The type specimens are preserved in the National Science Museum, Tokyo (NSMT). We are very grateful to Messrs. Tetsuo Yagura, Ryoichi Nishinaka, Shigeo Hamaguchi and Hideo Hashimoto of the Kii-Minabe Fishermen's Cooperative Association, who offered us the specimens for study.

Genus *Atergatis* de Haan, 1835

Atergatis interruptus sp. nov.

(Figs. 1–2, 3 A–B)

Material examined. Off Shirahama, Kii Penin., Wakayama Pref., Japan, ca.

110 m deep, M. Marumura leg. — ♂ (Holotype, NSMT-Cr 12024; cl 43.5×cb 68.0 mm), Mar. 15, 1995; 1♂ (Paratype, NSMT-Cr 12025; cl 46.3×cb 70.6 mm), Feb. 23, 1996.

Description. Carapace transversely elliptical, ca. 1.56 (holotype) and 1.52 (paratype) times broader than long; dorsal surface shining, seemingly smooth, only with minute punctures of various sizes, being regularly convex dorsally along frontorbital and anterolateral margins, with its median part rather flattened; regions ill-defined, with shallow linear furrows demarcating protogastric, mesogastric and cardiac regions; a pair of small pits side by side at posterior part of mesogastric region. Front ca. 0.5 times as wide as carapace, slightly projecting forward beyond general elliptical outline of carapace, divided into two lobes by a median small, but distinct notch; each lobe weakly convex, narrowly rimmed, continuous with supraorbital margin through a shallow dorsal and anterior depression. Frontorbital width ca. 0.37 times as wide as carapace; supraorbital margin narrowly rimmed like frontal margin, raised dorsally, continuous with anterolateral margin through a shallow, but distinct depression.

Anterolateral margin strongly convex outwards so as to form a regular curve, without any indication of notches, being fringed with a narrow, but distinct rim for its whole length; rear end of rim not at all angulated, but quite distinctly isolated from posterolateral margin which is thickened and convex for its anterior 1/3 behind rear end of anterolateral rim; posterior 2/3 of posterolateral margin nearly straight, strongly convergent towards lateral end of posterior margin. Posterior margin subequal to frontorbital margin, fringed with short hairs.

Third maxillipeds, sternum, ventral surfaces of coxae of chelipeds and ambulatory legs, and abdomen thickly covered with yellowish stiff setae of various lengths.

Both chelipeds robust, subequal in size and shape; ischium and merus short, disguised under carapace in natural posture, with whole length of ischium and proximal 1/2 of merus fringed with brush-like yellow hairs; carpus with 2 blunt teeth and 3 tufts of yellow hairs at its inner angle; palm robust, inflated, roughened with minute punctures, without distinct crest at basal upper part. Fingers black, with whitish cutting edges of 4 or 5 blunt conical teeth; tips subacute, curved inward.

Ambulatory legs depressed, broad, with strongly crested anterior margins. Each merus fringed with equidistant tufts of yellow hairs, 5 along upper margin and 3 or 4 at proximal half of posterior margin; carpus also with 1 or 2 similar tufts on anterior margin; surface along posterior margin of propodus with short tomentum, fringed with longish hairs; dactylus also with short tomentum for its upper surface except for a longitudinal median ridge.

Male first pleopod with a recurved small beak, with a fringe of 15 long hairs distally.

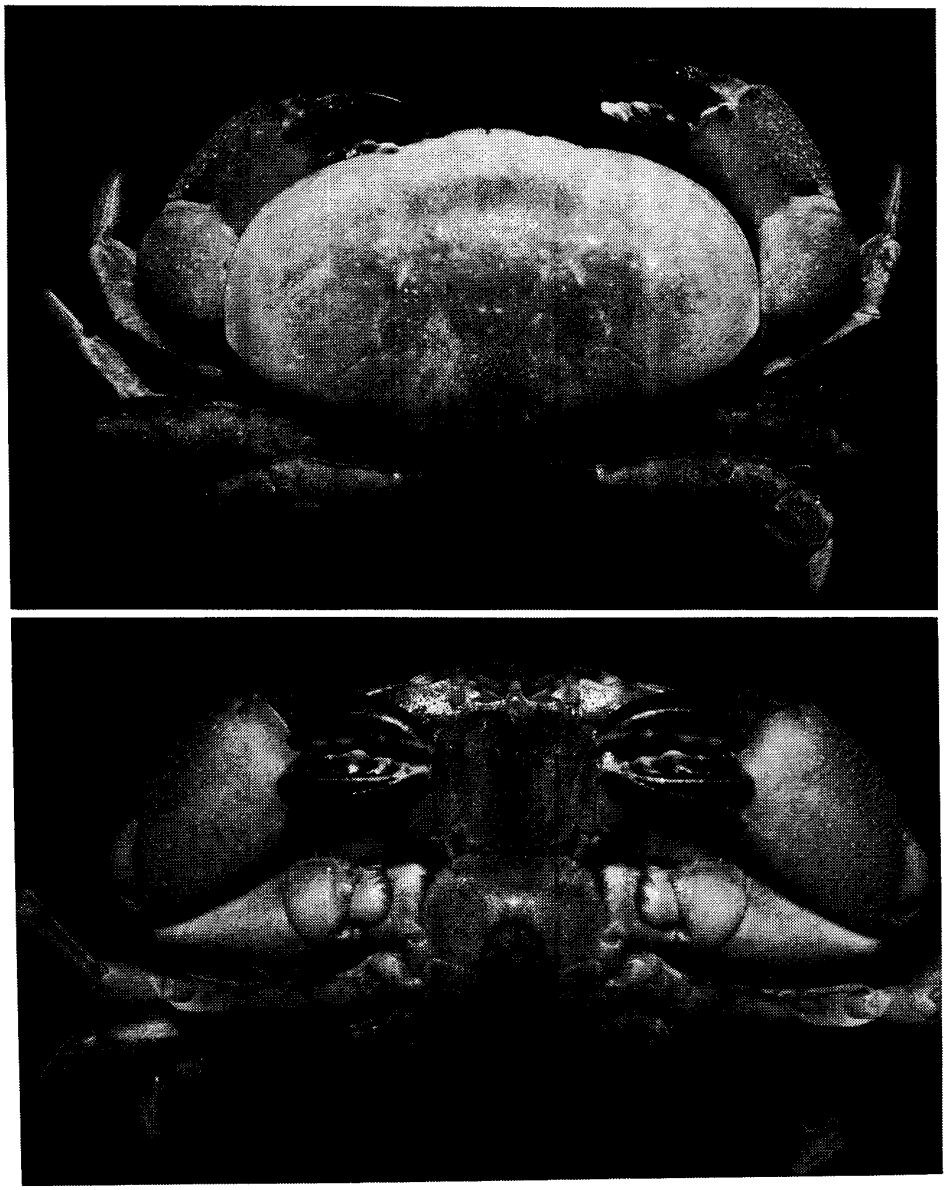

Fig. 1. *Atergatis interruptus* sp. nov., paratype ♂ (NSMT-Cr 12025; cl 46.3×cb 70.6 mm) in dorsal and ventral views.

Etymology. The specific name is derived from the interrupted anterolateral and posterolateral margins of the carapace, the most important feature to distinguish the new species from the congeners.

Remarks. The genus *Atergatis* is currently known by eleven Indo-West Pacific species which are divided by Serène (1984) into three groups based on the disposition of the epibranchial angle of the carapace. The present new species belongs to the group having neither traces of teeth nor an inward ridge marking the junction of the anterolateral and posterolateral margins. Following Serène's key, the new species is keyed out to *A. laevigatus* A. Milne Edwards and *A. obtusus*

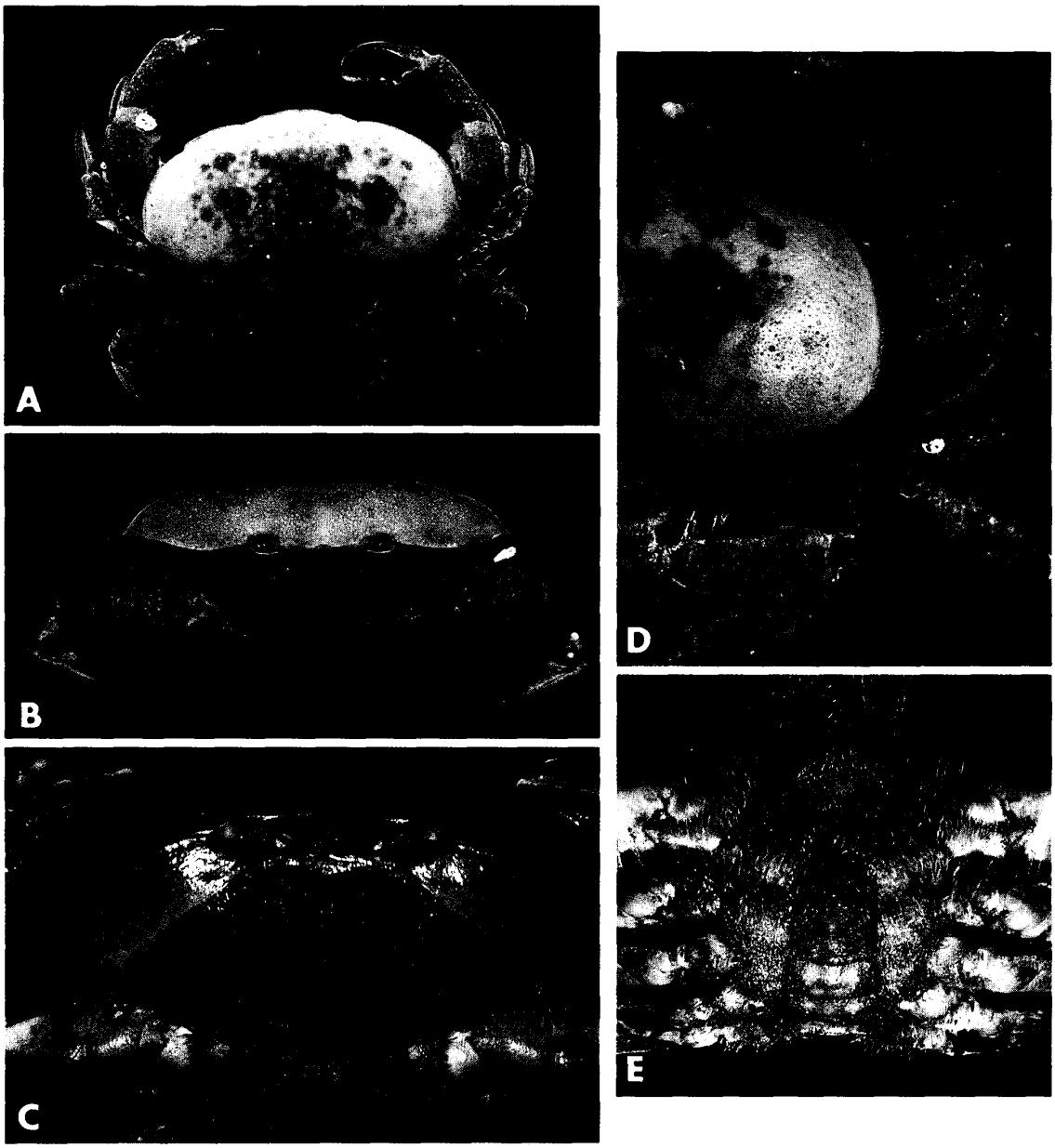

Fig. 2. *Atergatis interruptus* sp. nov., holotype ♂ (NSMT-Cr 12024; cl 43.5×cb 68.0 mm) in different views.

A. Milne Edwards, which differ from each other in the proportion of the carapace. In these two species the carapace is 1.60–1.70 and 1.50 times broader than long, respectively. In the new species, as mentioned in the description, it is 1.52 in the holotype and 1.56 in the paratype.

Atergatis laevigatus and *A. obtusus* are rather poorly known, but at least there may be no doubt about the validity of *A. laevigatus* known from India and the Red Sea, because the original drawing by A. Milne Edwards (1865) and the photo-

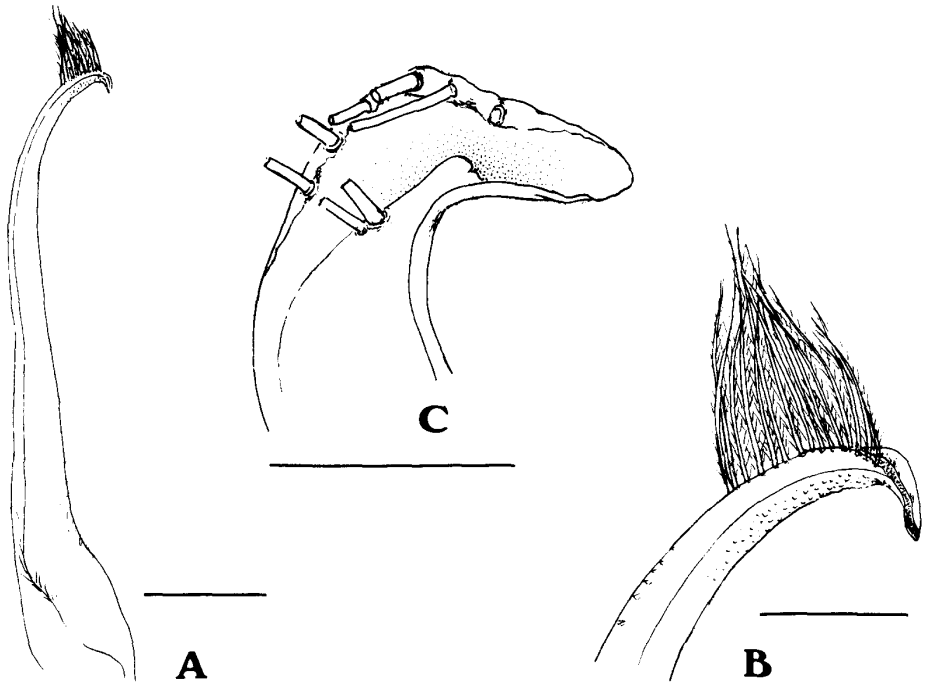

Fig. 3. First male pleopods of holotypes of *Atergatis interruptus* sp. nov. (A–B) and *Meriola corallina* sp. nov. (C). Scale for A=5 mm; scales for B and C=1 mm.

graph of the holotype given by Serène (*loc. cit.*) decidedly coincide with eath other and make the species readily distinguishable from the related species. Contrary to *A. laevigatus*, a sole type specimen of *A. obtusus* from South Vietnam is rather small, 41.7×27.7 mm, with some doubt for its maturity. It is generally known in the genus *Atergatis* that the proportion of the carapace varies according to developmental stages. The original figure of *A. obtusus* indicates that the contour of the carapace is ovate without projecting anterolateral shoulders somewhat like that of *A. floridus* (Linnaeus). If the type specimen is fully matured, it differs distinctly from *A. laevigatus* not only in the proportion of the carapace, but also in the contour of the carapace with or without shoulders.

The new species is without doubt close to *A. laevigatus* in its general appearance, having the anterolateral margin strongly convex with shoulder and a narrow rim throughout its length. In *A. laevigatus*, the anterolateral margin continues smoothly to the posterolateral margin without any interruption in its dorsal view, although a rim is fringing only on the anterolateral margin as usual. In the new species, however, the anterolateral and posterolateral margins are distinctly interrupted just behind the rear end of the anterolateral marginal rim, with convex anterior half of the posterolateral margin. Furthermore, the fringe of some tufts of stiff setae along the anterior margins of the ambulatory legs may be characteristic of the new species.

Genus *Meriola* Davie, 1992
Meriola corallina sp. nov.

(Figs. 3 C, 4–5)

Material examined. Off Iwashiro, west coast of Kii Penin., Wakayama Pref., Japan, M. Marumura leg. — ♂ (Holotype, NSMT-Cr 12026; cl 22.8 × cb 37.8 mm), ca.60 m deep, Dec. 7, 1995; 1 ♀ (Paratype, NSMT-Cr 12027; cl 27.8 × cb 45.6 mm), ca. 70–80 m deep, Dec. 27, 1995.

Description. Carapace transversely ovoid, 1.64 and 1.66 times broader than long in paratype and holotype, respectively, with frontorbital breadth being 0.43 times as broad as carapace; its dorsal surface evenly convex fore and aft, more weakly so from side to side, smooth, shining, finely punctate; regions moderately defined with linear gastric and branchial furrows; frontal margin ca. 0.4 times frontorbial breadth, subtruncated, only slightly projected from general contour of carapace, with a small median notch; frontal region (1F + 2F) raised, thickened along frontal margin, shallowly separated by a transverse depression from epigastric region (1M) which is confluent with inner half of protogastric region (2M); linear furrows distinct along anterior 2/3 of both sides of protogastric region, faded posteriorly toward posterior end of protogastric region; anterior narrow part of mesogastric region (3M) ends at level of median part of epigastric region; metagastric region (4M) not discriminated, only with a pair of small pits side by side as an indication of boundary; cardiac region (1P) traceable, wider than mesogastric region, being surrounded by broad shallow furrows or depressions; intestinal region (2P) not prominent; branchial regions (1–3L) fused for their most parts, but indistinctly separated to each other for their lateral parts by grooves from posterior 2 anterolateral notches between 2nd and 3rd teeth and 3rd and 4th teeth; anterior groove longer, weakly curving forward, posterior groove shorter, subparallel to the former, but somewhat directed posteriorly.

Supraorbital margin with 2 interruptions laterally, with orbital region thickened to form a callus for its inner main part, being delimited from protogastric region by a distinct furrow along orbit. External orbital angle thickened, blunt, not protruded from general contour of carapace. Infraorbital margin deeply concave at its median part, with prominent rounded lamellar inner angle. Antennal basal segment just touching ventral prolongation of front, with flagellum entering into orbit.

Anterolateral margin weakly arched as a whole, bluntly crested, with 4 teeth behind external orbital angle. First tooh nearly horizontal and straight for its most part, separated indistinctly from external orbital angle by a shallow depression, distinctly from 2nd tooth by a small notch; many pits of good size making its dorsal surface or hepatic region uneven and eroded; its ventral surface or subhepatic region minutely granulated. Second tooth as long as first tooth,

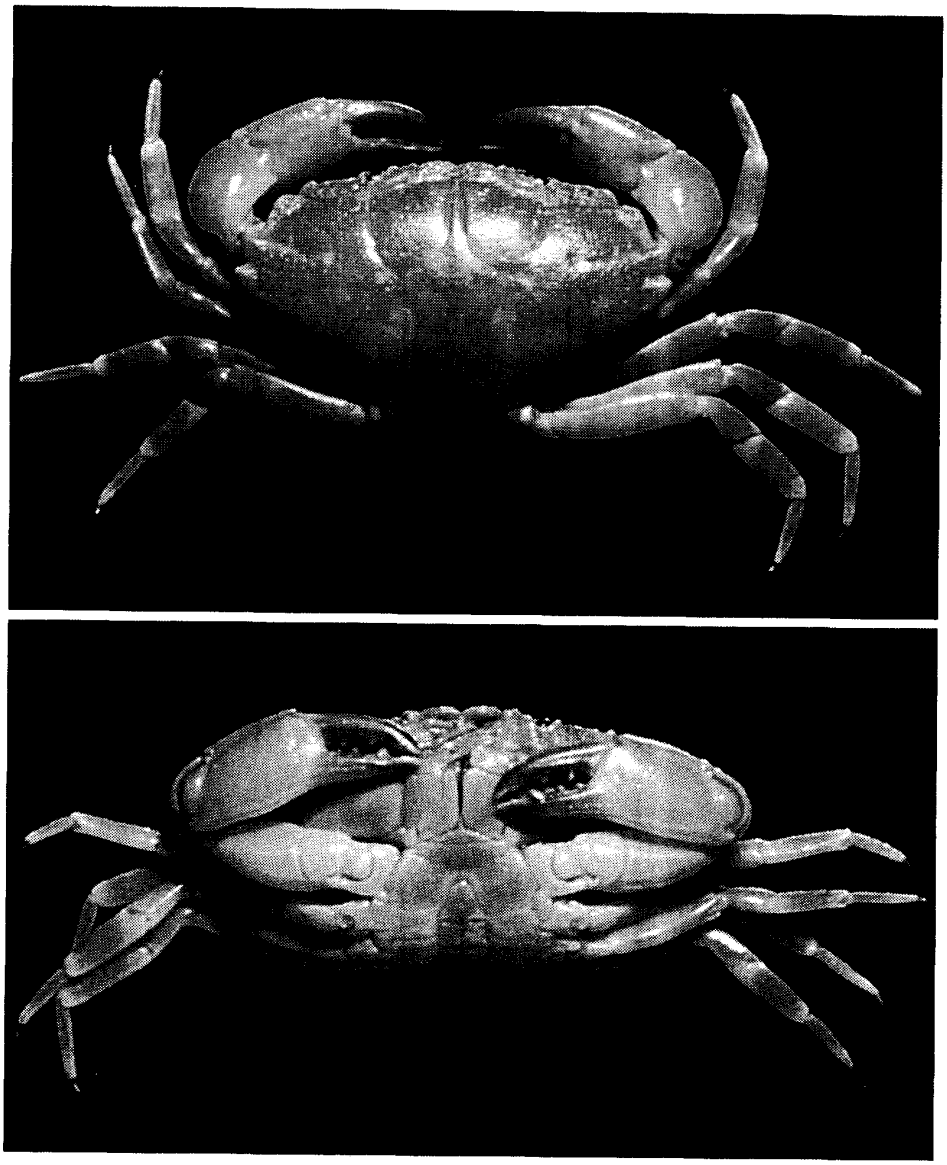

Fig. 4. *Meriola corallina* sp. nov., paratype ♀ (NSMT-Cr 12027; cl 27.8×cb 45.6 mm) in dorsal and ventral views.

oblique, straight for its most length, with rounded margin anteriorly. Third tooth about 2/3 as long as 2nd tooth, rather angulated anteriorly to form a triangle directed anterolaterally, with its posterior margin being nearly longitudinal and longer than anterior margin. Fourth tooth smaller than 3rd tooth, subacute, more or less tuberculate, distance between 4th teeth of both sides taking greatest breadth of carapace. Posterolateral margin straight, slightly longer than anterolateral margin, strongly convergent posteriorly toward posterior margin of carapace; posterior margin as wide as frontorbital margin.

Third maxilliped as seen in photograph.

Chelipeds subequal in both sexes, moderate in size, smooth with sparse small

punctures. Merus disguised under carapace for its most part, finely granulated on margins. Carpus comparatively large, truncated on its inner surface, with bluntly angulated inner upper and lower angles. Palm weakly compressed, upper margin rather thickened as a whole, with a longitudinal shallow furrow on outer upper surface, weakly tapering distally; lower margin thin. Fingers dark-coloured, more than half as long as lower margin of palm, with 5 teeth on each cutting edge; inner surfaces grooved, spooned at tips, with a narrow gape between both fingers.

Ambulatory legs remarkably long, slender, compressed, without fringe of hairs; first 3 pairs subequal in length and shape, 4th pair similar to, but only slightly shorter than preceding pairs. Carpus and propodus combined as long as merus, propodus 1/3 longer than carpus, subequal in length to dactylus.

Male abdomen 5-segmented, with fused 3rd to 5th segments; 1st and fused segments subequal in width; fused segment weakly tapering, penultimate segment quadrate; terminal segment as long as wide, evenly rounded, slightly longer than penultimate segment.

Male 1st pleopod long, moderately stout, with strongly curved pointed beak fringed with several long setae along subdistal margin.

Etymology. The specific name is referred to the brick red coralline colour of the carapace, chelipeds and ambulatory legs.

Remarks. The genus *Meriola* was established by Davie (1992) to accomodate the type species, *M. rufomaculata* Davie, 1992 from the Tuamotu Archipelago, and *Neoliomera acutidens* Sakai, 1969 from Japan. This genus is characterized by the combination of some features close to the genus *Liomera* Dana. Although it may be difficult to depict the genus only on definitive characters, the wide carapace with the regions moderately, rather shallowly defined by linear furrows, the thickened four-toothed anterolateral margin with more or less angulated posterior two teeth, and the long ambulatory legs are characteristic for this genus.

The present new species is distinguished from *M. rufomaculata* by having the proportionally wider carapace with the strongly developed posterior two anterolateral teeth that project from the general contour of the carapace. The uniform brick-red colour of the new species reproduced in this paper is different from that of *M. rufomaculata*, which is, as known from the scientific name, marked with large, symmetrical orange/red patches on light blue-gray ground colour after preservation.

The present new species is unexpectedly close to *M. acutidens* in its general appearance. According to the original and subsequent descriptions and figures of *M. acutidens* (under the genus *Neoliomera*, Sakai, 1969, 1976), however, the anterior and lateral surfaces of the carapace are covered with depressed granules, of which those near the anterolateral teeth are larger, the second anterolateral tooth regularly convex, the third anterolateral tooth is more strongly directed

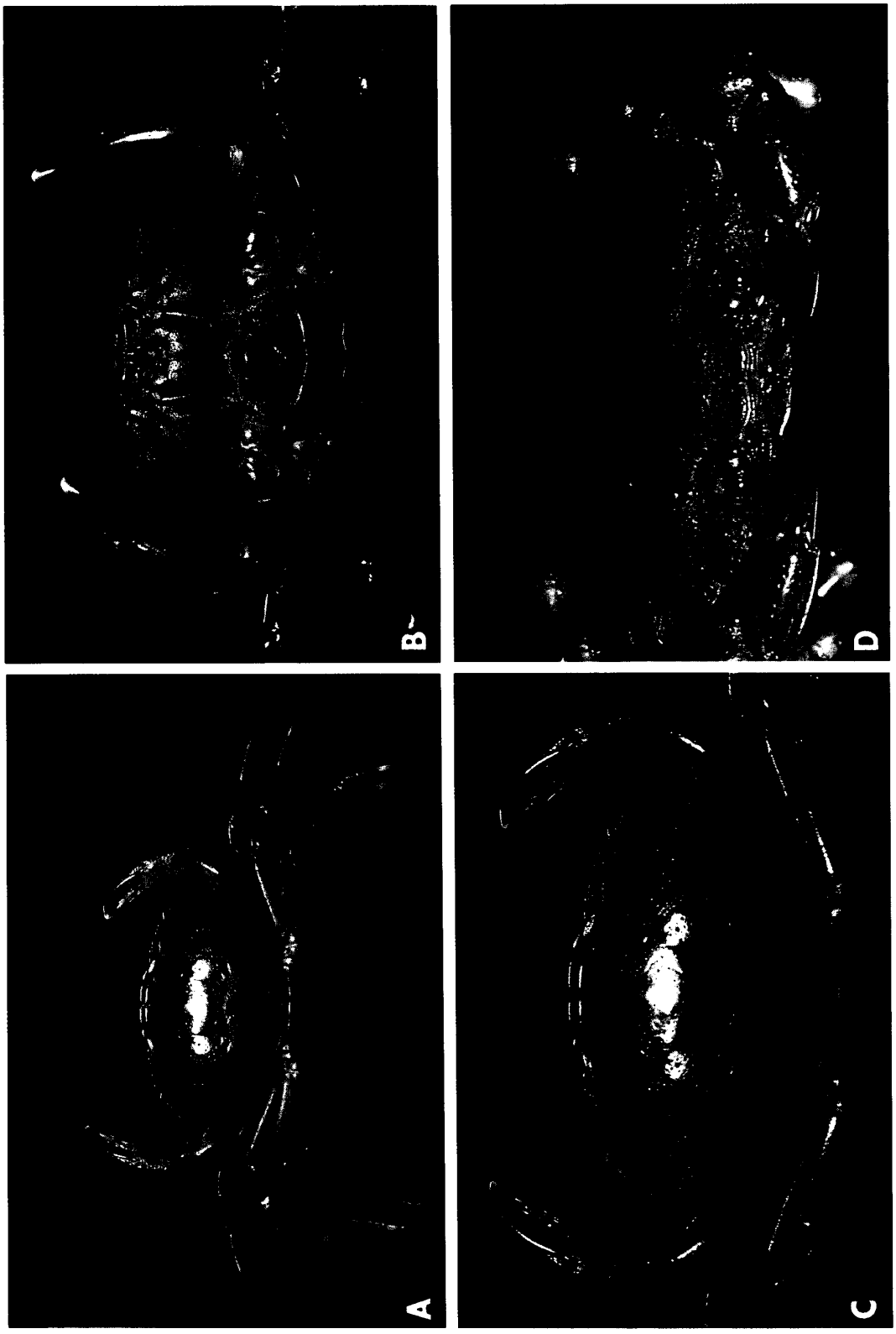

Fig. 5. *Meriola corallina* sp. nov. A–B, holotype ♂ (NSMT-Cr 12026; cl 22.8×cb 37.8 mm) in dorsal and ventral views; C–D, paratype ♀ (NSMT-Cr 12027; cl 27.8×cb 45.6 mm) in dorsal and frontal views.

obliquely outward, and the dark colour of the immovable finger in male extends onto the outer and inner surfaces of the palm. The ambulatory legs are described to be very slender, but according to the original drawing, they are seemingly shorter than those of the present new species. The original figure of the male first pleopod seems to be not always accurate, because "a small obtuse process" at subdistal part may be the tip of the pleopod, corresponding to the inner view of "beak" and "swans head" described for the present new species and *M. rufomaculata*, respectively. In this case, the long hairs are fewer in *M. acutidens*, but the basic formation of the male first pleopod is close to each other in these three species, and not effective to distinguish them definitely.

In the male first pleopod of the holotype of the new species, unfortunately, most of the marginal setae of the beak are broken off probably in process of examination.

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